
Space Weather Forecast

Issued on Friday, 17 May 2024 at 13:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Likely chance of isolated Moderate flares, and Slight chance of isolated Strong flares throughout. Decreasing Chance of renewed S1/Minor Solar Radiation storming Day 1 (17 May).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the past 24 hours, with an upper Common-class flare observed at 17/0146 UTC from a moderate size bipolar region approaching the south central disc. Any activity from the large and active region that was responsible for a number of recent Strong flares is now likely to be completely obscured as it has fully retreated onto the far-side. There are currently fourteen sunspots on the disc, 13 of which are numbered. The largest lies close to the southeast limb. This region is composed of a number of large spots which may be a closely connected collection of different regions, however, magnetic looping is visible across the region and as such it remains classed as one large sunspot group. A new region continues to emerge from the southeast limb, just to the north of this group, although the limited viewing angle reduces confidence in its analysis. There are three other regions of modest size that also exhibit some magnetic complexity, two in the southwest and one approaching the solar meridian in the south. The other sunspot regions are generally smaller, simpler and stable, or in slight decay.

No Earth-directed CMEs were identified in available imagery.

Solar Wind / Geomagnetic Activity: Any residual CME effects at the start of the period, soon waned, with solar winds declining and settling in the range 370-420km/s. The Interplanetary Magnetic Field (IMF), was occasionally at moderate strength, with the important north-south component fluctuating between weakly negative (southward) and briefly moderate positive (northward), but remained largely positive (north oriented). Geomagnetic activity was initially Unsettled to Active (Kp 3 to 4), but fell to Quiet levels (Kp 1-2) from 16/1800 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was above at S1/Minor Radiation storm levels until around 16/1450 UTC due to the flare activity over recent days from the large complex sunspot (now over the southwest limb). This count rate continues to very gradually ease.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is now expected, with a slight chance of isolated Strong flares. The regions currently on the visible disc are smaller and simpler, with isolated M-flares possible from these. A new region may rotate onto the northeast disc later Day 1 or Day 2 (17-18 May) with no other significant regions expected to return or rotate onto the disc during the period.

Solar Wind / Geomagnetic Activity: A glancing coronal mass ejection (CME) arrival is possible
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later Day 1 (17 May) from a filament eruption on the northeast disc on 14 May. Solar winds are expected to remain at background levels, but close to slightly elevated levels. Chance of some further enhancement from uncertain CME arrival. Activity is expected to be mainly Quiet (Kp 0-2) with Unsettled (Kp 3) intervals. Chance of an Active interval and a slight chance of a G1/Minor Geomagnetic storm intervals from any CME glances, mainly later Day 1 (17 May).

Energetic Particles / Solar Radiation: The count rate of energetic particles is likely to remain at background levels. Although there is a chance that should any significant flares from the large and complex sunspot (now on the far-side) occur on Day 1 (17 May) that enhancement may cross the S1/Minor Radiation storm threshold.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	10	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	Yes	30	20	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)